Persistent neglect in everyday life

Clinical Postcard

PERSISTENT NEGLECT IN EVERYDAY LIFE

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Key words: Unilateral Spatial Neglect; Assessment; Everyday tasks; Recovery.

Unilateral Spatial Neglect (USN) is a multifarious syndrome (Cubelli, 2017), aspects of which could be long lasting either as poor performance on individual diagnostic tests (Farnè et al., 2004), in subclinical forms (Colombo et al., 1982) or as a marked preference for the ipsilesional side even in the absence of overt omissions (Mattingley, et al., 1994). The assessment of USN, both when first diagnosed and in the follow-ups, is carried out by means of standard tests. However, these tests are not equipoise in detecting USN (Halligan et al., 1989); they can present double dissociations (Halligan and Marshall, 1992) and can be differentially sensitive to compensation strategies (Campbell and Oxbury, 1976). Therefore, it is widely assumed that the more tests are used, the higher is the probability of detecting signs of initial or residual USN (Azouvi et al., 2006). Nevertheless, we have observed a dissociation between normal performance on all formal tests of a very large battery and clear signs of USN in everyday tasks and actions.

----- Insert Table 1 about here -----

Table 1 summarises the performance on USN tests of 10 patients showing such dissociation. They were followed up longitudinally and all underwent a rehabilitation programme. They were all tested with a comprehensive battery encompassing 22 classic USN tests (18 assessing extrapersonal and 4 personal USN), including the CBS Scale described as "probably, to date, the most widely used behavioural assessment instrument for unilateral neglect. It has been found to be reliable, valid, and sensitive to changes during rehabilitation. It also enables the assessment of awareness of the consequences of unilateral neglect in daily life skills." (Azouvi, 2017). In the last assessment, the participants were also tested with the Raven Coloured Progressive Matrices (RCPM), a test geared at investigating general intelligence and visuo-spatial problem solving (Basso et al., 1987), found to be sensitive to USN (Colombo et al., 1976), and a Dual Task (DT) condition using stimuli from the Attention Process Training (APT) (Sohlberg and Mateer, 1987). The diagnosis of USN required the detection of USN signs in at least one of the 22 tests, independently of its severity. The complete list of tests is given in the Supplementary Material. Some patients performed normally on all diagnostic tests when first assessed; they all performed normally in the last assessment. This notwithstanding, they all presented with evident signs of USN in everyday tasks as spontaneously revealed by their carers, either professionals, like

occupational therapists, or relatives, or both (Table 1). Patients 1, 2, 3, 4, 5 and 6 initially had extrapersonal USN. Patient 6 showed everyday signs of personal USN, never evinced with the standard tests. Patient 7 initially had personal USN, recovered with time, yet she showed USN in everyday tasks. Patient 8 never performed pathologically in any of the USN formal tests, yet she showed apparent signs of both extrapersonal and personal USN in everyday life. Patients 9 and 10 also never performed poorly on formal USN tests but undoubtedly had signs of personal USN in ordinary tasks. Three patients showed signs of USN in the RCPM whereas seven showed signs of USN when tested in the DT condition.

This observation has clear practical implications (for instance advising patients about driving) as well as theoretical interest. The dissociation could be explained in terms of the patients' expectation during formal testing; having repeated the same tests they may become aware of their demands, hence performing better than their current USN would allow. Alternatively, one can speculate that contrary to the formal clinical assessment patients whereby patients requested to focus on the tasks, in everyday life, whereby every task is virtually a multiple task, this is unlikely to occur. Yet, some patients showing clear signs of USN in everyday tasks performed well both in the novel task (RCPM) and in the DT condition making it unlikely that either of the two hypotheses can fully account for the discrepant performance between well executed standard tests and clear signs of USN in carrying out everyday chores.

The implications from this observation are that even using large batteries of tests (e.g., Eschenbeck et al., 2010) does not avoid the oversight of USN, although the use of novel tasks and dual tasks improves the likelihood of detecting signs of USN. Moreover, in diagnosing USN, clinicians should consider that even ecological tasks simulating everyday activities in the lab may not be sufficient to detect it, making it very relevant to carefully interview the caregivers. Finally, the current observation also implies that USN may not have completely recovered even if undetected by standard tests. The clinical consequence of this conclusion is that, in the follow-up stages, the neuropsychological assessment should aim at demonstrating the absence of USN, including alerting the caregivers on the possible consequences of USN in everyday life.

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Supplementary Material

List of the 22 tests for USN included in the assessment battery:

1. **Line Cancellation**: Albert M.L. (1973). A simple test of visual neglect. *Neurology*, 23: 658-664.
2. **Star Cancellation**: Wilson, B., Cockburn, J., Halligan, P. (1987). Development of a behavioral test of visuospatial neglect. *Archives of Physical Medicine and Rehabilitation*, 68(2), 98-102.
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12. **Comb and Razor**: Beschin, N., Robertson, I. H. (1997). Personal versus extrapersonal neglect: a group study of their dissociation using a reliable clinical test. *Cortex*, 33(2), 379-384.
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14. **CBS**: Azouvi P., Samuel C., Dreyfus A., et al (2002). Sensitivity of clinical and behavioural tests of spatial neglect after right hemisphere stroke. *Journal of Neurology Neurosurgery and Psychiatry;* 73: 160-166.
15-22. 8 tests from the **BIT**: Spinazzola L., Pagliari C., Beschin N. (2010). *BIT Behavioural Inattention Test*. Adattamento italiano. Firenze OS.

Table 1. (a) Demographic and clinical data of the 10 patients included in the study together with their performance on some representative tests on the first (b) and last (c) assessment. (Full background data set available from the authors).

a	Demographic and clinical data							
Pt Code	**Age (yrs.)**	**Ed. (yrs.)**	**Sex**	**Stroke**	**Lesion site**	**VFD***	**Visual Extinction#**	**Paresis#**
1	71	11	M	I	P	+	n.e.	-
2	71	13	M	I	FTP	-	-	-
3	55	23	W	H	T, bg, cc	-	-	-
4	71	8	M	I/H	PTO	+	n.e.	-
11	54	23	M	H	F	-	-	-
12	75	5	M	I	F, bg	-	-	-
9	67	5	W	I	Pons, Th.	-	-	+
7	67	12	W	I	FTP, bg, ic	-	-	+
6	66	5	W	H	ic	-	+	+
8	68	7	M	I	P	-	-	+

b	First assessment									
Pt Code	**Line Canc.**		**Star Canc.**		**Line Bisection (mm)**	**Copying**	**Reading**	**Fluff Test (diff)**	**CBS**	
	L	R	L	R					Pt	Cg
1	5*	18	0*	13	67.3 to R*	2*	0	6*	18	27*
2	6*	17	17	18	3.6 to R	0*	6	3*	1	18*
3	14*	18	24*	27	7.3 to R	9	6	5*	12	18*
4	18	18	26	27	30.3 to R*	7*	4*	0	2	24*
5	7*	18	19*	27	18.3 to R*	6*	4*	0	6	26*
6	18	18	26	26	30.1 to R*	5.5*	3*	2	0	21*
7	18	18	27	27	1.9 to R	10	6	2	4	4*
8	18	18	19*	21*	6.1 to R	10	6	2	0	11*
9	18	18	26	25	3.7 to R	10	6	1	0	10*
10	18	18	17*	15*	5.2 to |R	9.5	6	1	0	22*

c	Last assessment									
Pt Code	**Line Canc.**		**Star Canc.**		**Line Bisection (mm)**	**Copying**	**Reading**	**Fluff Test (diff)**	**CBS**	
	L	R	L	R					Pt	Cg
1	18	18	24	21	12 to L	10	6	0	0	4*
2	18	18	21	21	1.6 to R	9.5	6	1	0	3*
3	18	18	27	27	1.9 to R	9,5	6	0	4	3*
4	18	18	27	27	6.3 to R	10	6	0	0	4*
5	18	18	27	27	1.3 to R	10	6	0	0	3*
6	18	18	27	27	5.5 to R	9,5	6	0	0	3*
7	18	18	27	27	0.9 to R	10	6	0	4	4*
8	18	18	18	17	4.7 to L	9.5	6	2	0	5*
9	18	18	26	25	4.2 to R	9,5	6	0	0	3*
10	18	18	16	16	2.8 to L	9,5	6	0	0	4*

Legenda. Pt = patient; M = man; W = woman; H = haemorrhagic, I = ischaemic; L = left; R = right; VFD = visual field defect; P= Parietal; F = Frontal; T = Temporal, bg = Basal Ganglia; cc = Corpus Callosum; O = Occipital; ic = internal capsulae; Th = thalamus, ins = insula; +: presence; -: absence; Canc. = Cancellation; CBS = Catherine Bergego Scale (Pt: patient; Cg: caregiver).
*The asterisk indicates detection of USN.
# Last assessment
n.e. = not evaluated